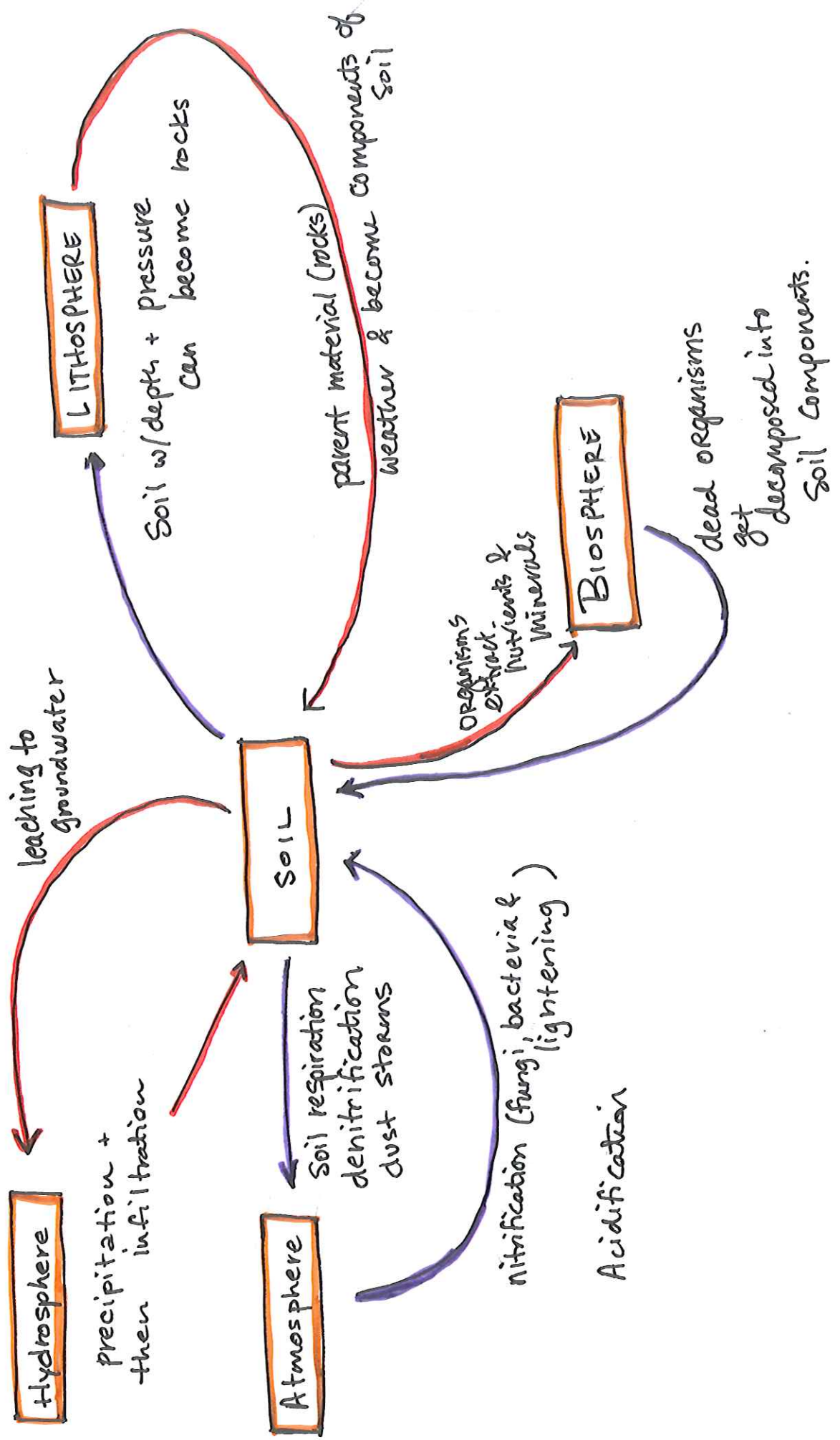


Soil as a System

3.4.1 Outline how soil systems integrate aspects of living systems.

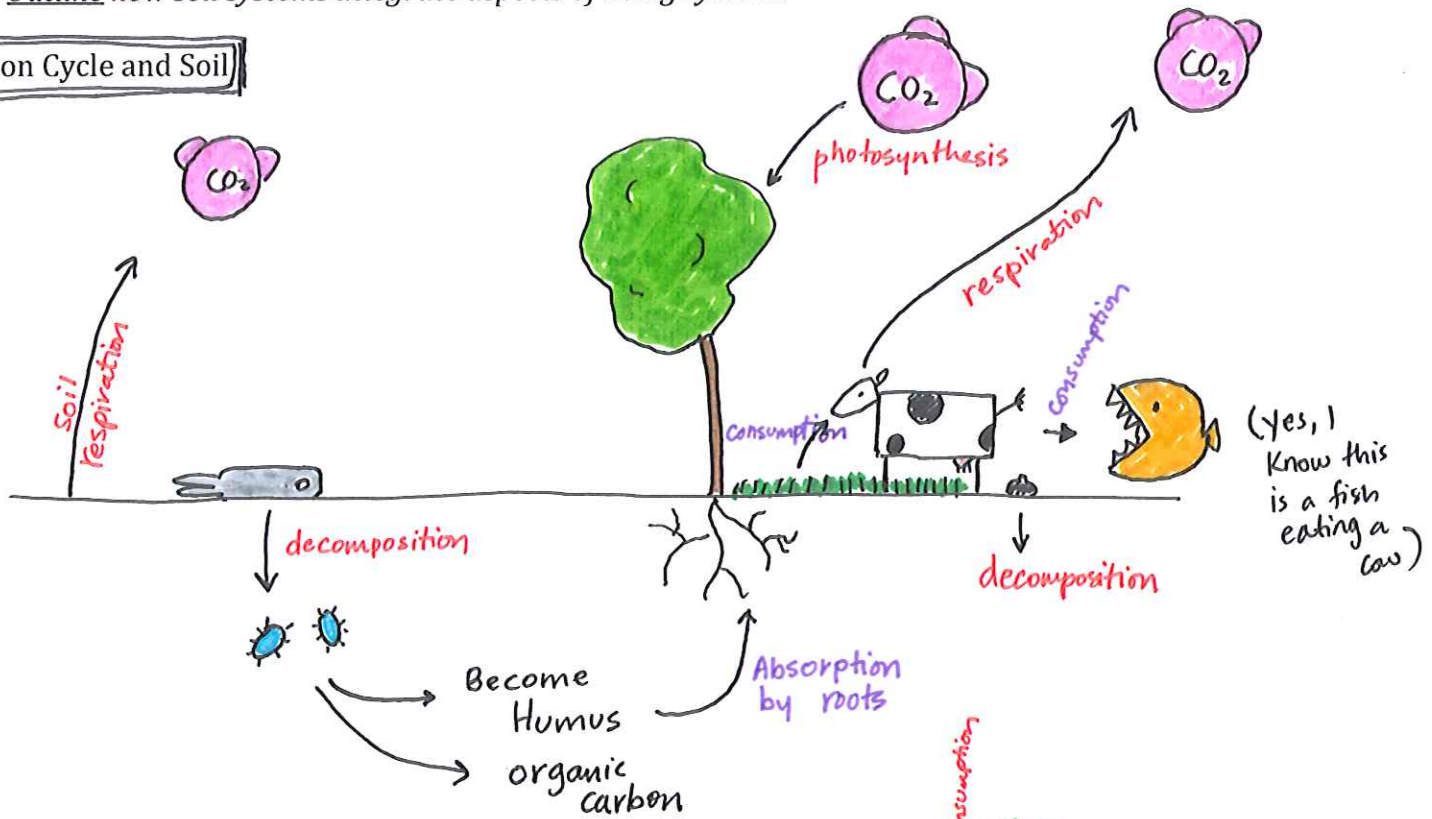
- Transformation
- Transfer
- Stock



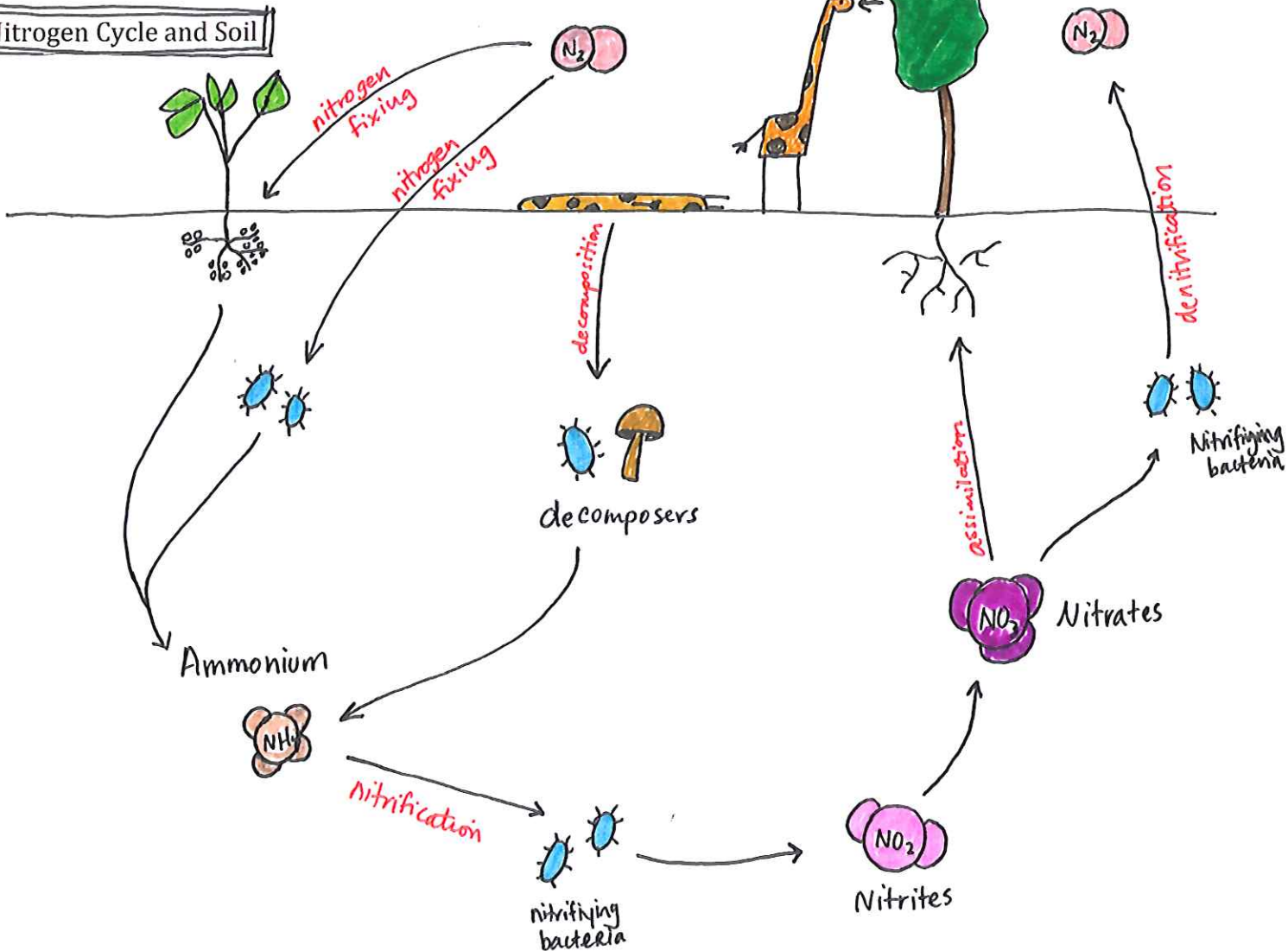
Soil as a System

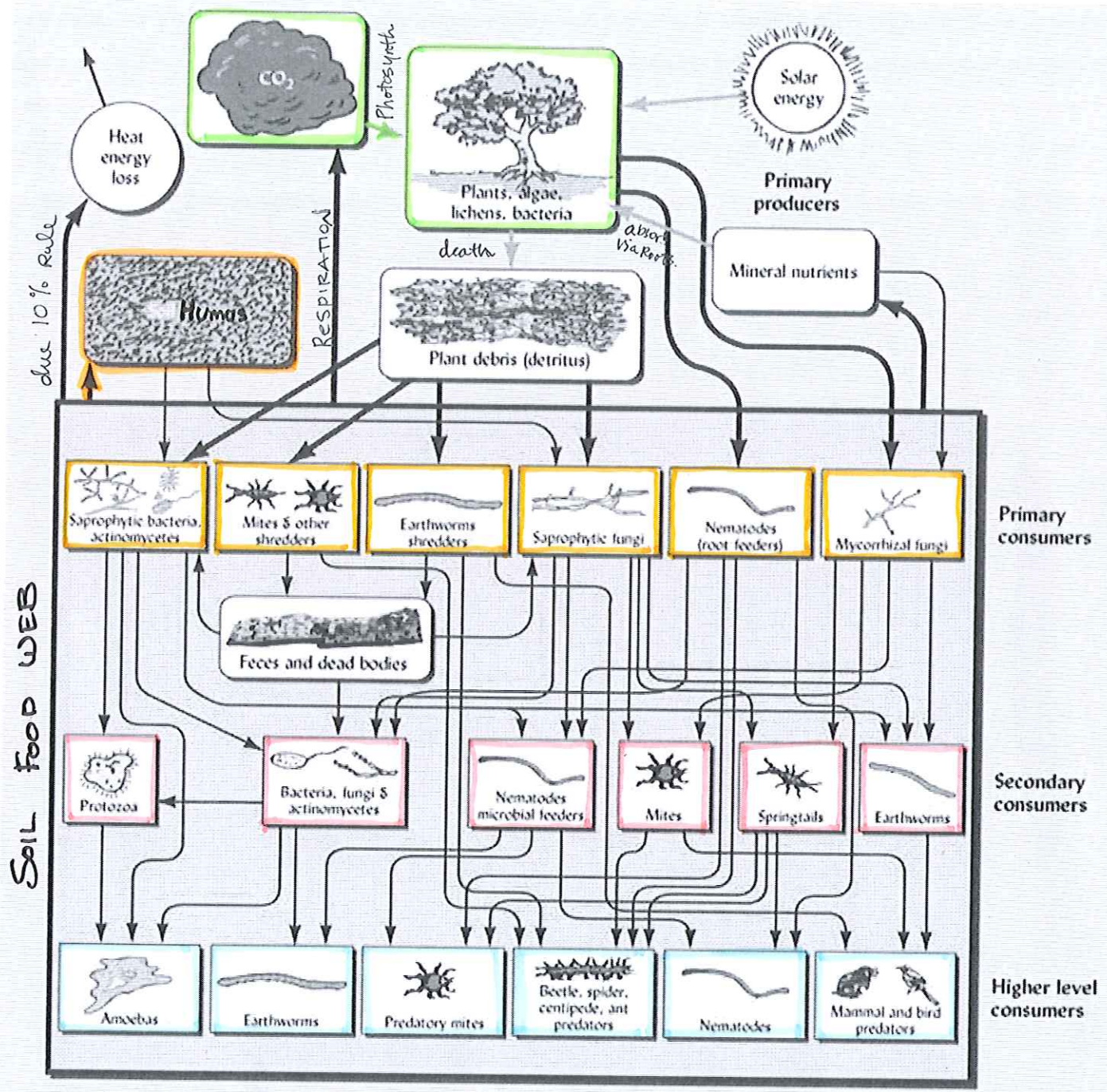
3.4.1 Outline how soil systems integrate aspects of living systems

Carbon Cycle and Soil



Nitrogen Cycle and Soil





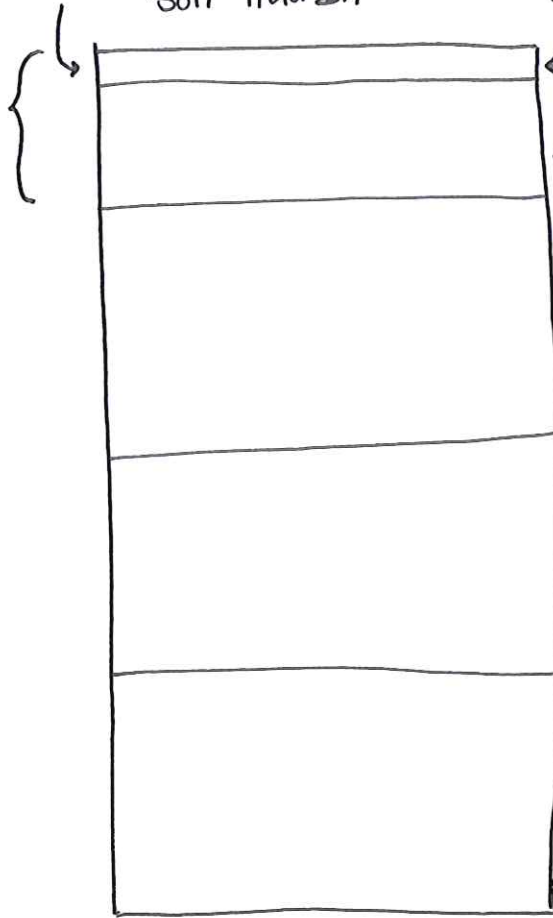
Soil Profiles

A "profile" of soil is
Kind of like a
doll house
where you
see all the layers



Each layer is a
Soil Horizon

TOPSOIL



← O dark + soft
Contains Humus (lots of organic matter)
leaf litter

← A dark color, Most Biologically Productive
lots of worms, fungi + organisms

← B Rich in clay + minerals (like Iron +
Magnesium)
Red + Brown Color due to
Minerals

← C Made up of large Rocks or
partially broken bedrock.
Affected little by weathering
little organic material

Bedrock Layer

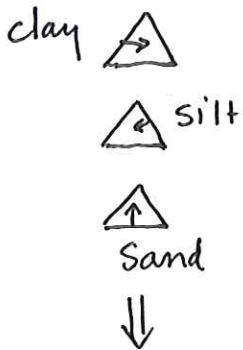
← R Continuous Mass of bedrock

Many ways
to characterize
soils

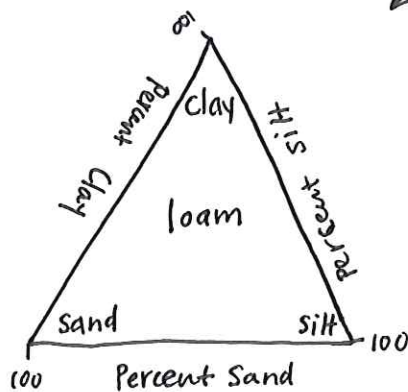
lots of
characteristics:

Color (darker ↑ Organic Content)
pH (Medium is ideal)

texture → Porosity (space bwt
particles)
→ Permeability (how fast
H₂O absorbed)



Where do
the 3 lines
meet?



determine by soil settling &
sifting

Soil Structure

3.4.2 Compare and contrast the structure and properties of sand, clay, and loam soils, including their effect on primary productivity

	Sand	Clay	Loam
COMPOSITION	100% sand	100% clay	mixture of sand clay + silt
MINERAL CONTENT	HIGH	HIGH	MEDIUM
ORGANIC MATTER HOLDING	Low	Low	MEDIUM
DRAINAGE	HIGH	POOR	MEDIUM
AIR SPACES	LARGE	SMALL	MEDIUM
WATER HOLDING CAPACITY	Low (plants don't get H_2O)	VERY HIGH (plants suffocate)	MEDIUM
PLANTS & ANIMALS PRESENT	Low	Low	HIGH
PRIMARY PRODUCTIVITY	Low	VERY Low	HIGH

↑
P. Productivity depends on:

mineral content
medium drainage
need O_2 to breath → need air spaces
need organisms → make more humus → Loam
Organic matter (Nitrogen, Phosphorus, Potassium)